

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Koichi FUNAKI, et al. §
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Appln. No.: Not yet assigned. § Examiner: Not yet assigned.
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Filing Date: Herewith. § Attorney Docket No.: 10844-0038
§ (P-203093)
Title: SWIRL CHAMBER USED IN ASSOCIATION WITH A COMBUSTION CHAMBER
FOR DIESEL ENGINES

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.97(b)

Enclosed are copies of each of the documents listed on the attached Information Disclosure Citation Form PTO/SB/08A, which may be material to the patentability of this application and/or for which there may be a duty to disclose in accordance with 37 C.F.R. §1.56.

Some of the enclosed references were cited and discussed at pages 1-3 of the specification. The following comments summarize the cited references:

Japanese Patent Application Laid-open No. 60-95129: Figs. 1 and 2 show that a nozzle hole 6 is provided between a main combustion chamber 7 and a swirl chamber 1. There is also a sub-hole 15. From the drawing, the sub-hole does not seem to be positioned in pair symmetrically on the opposite sides of the nozzle hole. This structure cannot achieve the advantage that the air in the center of the swirl chamber is fully utilized.

Japanese Utility Model Application Laid-open No. 1-91034: Fig. 1 shows that the combustion chamber includes a sub-hole 5 directed toward the center of a swirl chamber, but it does not seem that the sub-hole is provided in pair; symmetrically on the opposite sides of the main hole. This structure cannot achieve the advantage that the air in the center of the swirl chamber is fully utilized.

Japanese Patent Application Laid-open No. 2001-271646: Fig. 1 shows that the combustion chamber is provided with a pair of sub-holes 4, and a main hole 21 having a pair of side holes 22 on its opposite sides. However, the sub-holes are not separated from the main hole, and their open ends are directly connected to the open end of the main hole. In light of non-disclosure of sub-holes separated from the main hole and directed toward the center of the swirl chamber, the advantage that the air in the center of the swirl chamber is fully utilized cannot be expected.

Japanese Patent Application Laid-open No.10-82322: Fig. 1 shows that the combustion chamber is provided with a main nozzle hole 7 having a pair of side holes 22, and a pair of sub-grooves 9. However, the sub-hole 9 is not separated from the nozzle hole 6, and communicates with the nozzle hole 6 in the periphery of it. This structure cannot achieve the advantage that the secondary air ejected causes effective swirls in the swirl chamber with the result of full utilization of the air in the center of the swirl chamber.

Japanese Utility Model Publication No.1-34657: Figs. 2, 3, and 5 show that the combustion chamber is provided with sub-hole 32. From Figs. 2, 3 and 5, it does not seem that the sub-hole 32 is provided in pair, but Fig. 6 shows that two holes 32 are provided as an alternative embodiment. However, they are not directed toward the center of the swirl chamber. This structure cannot achieve the advantage that the air in the center of the swirl chamber is fully utilized.

The filing of this Information Disclosure Statement shall not be construed as an admission that any of the listed documents constitutes prior art, nor as an admission against interest in any manner.

No fee is believed to be due in connection with the filing of this Information Disclosure Statement since it is being filed within three months of the filing date of the above-identified application. However, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayments to Deposit Account No. 50-1017.

It is respectfully requested that this Information Disclosure Statement and the documents listed on the attached Form PTO/SB/08A be considered and acknowledged by the Examiner in

connection with the above-identified patent application, be made of record therein, and that the listed documents be cited in the issued patent.

Respectfully submitted,

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